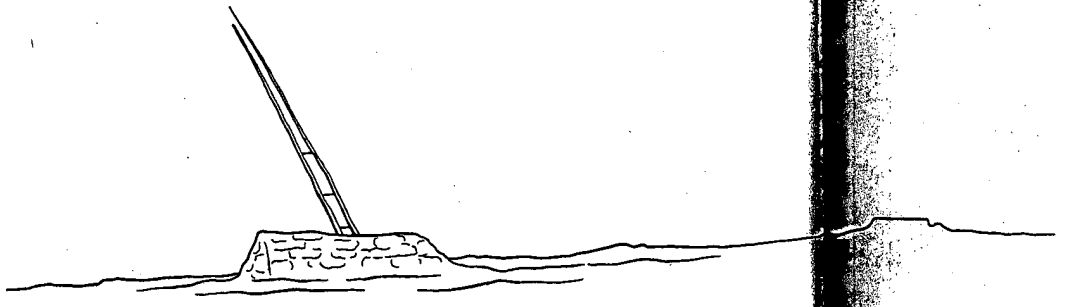
Sun in the Sky

By WALTER COLLINS O'KANE



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preservation of customs and values that might otherwise have been lost, and has helped to keep the racial stock pure.

The Hopi Reservation, established by executive order in 1882, is a rectangular area extending about fifty-seven miles from east to west and about sixty-eight miles from north to south. Its southern boundary is thirty-five miles north of Winslow, Arizona. It is completely surrounded by the vast Navajo Reservation.

Within the Hopi Reservation a smaller area was designated in 1934 as a Hopi grazing unit, or "use area." This is often—but incorrectly—referred to today as if it were the reservation. The official Hopi Reservation is still the rectangle of 1882, although the use of much of it has been lost to the Navajos.

The reservation lies in the high-altitude region of northern Arizona, where the height above sea level varies from five thousand to seven thousand feet. In every way—in climate, vegetation, and topography—this country is different from southern Arizona.

The land which the reservation occupies is tilted up from south to north. The southern part drops down toward the Little Colorado, which drains the entire area. The northern part is flung across the shoulders of Black Mesa, two thousand feet higher.

The surface of the country is deeply carved. In the southern part, black buttes rise from the broad and often sandy plains. In the northern part the elevated tableland of Black Mesa, with its dark growth of piñons and cedars, has been gouged out here and there to a distance of many miles, leaving long, irregular, knobby fingers reaching out toward the south. On these fingers or near their ends lie eleven of the Hopi villages. The twelfth, Moenkopi, is situated outside the reservation, forty miles to the west.

The villages are not conspicuous from a distance. The houses, mostly one-story, are of stone and are much the same color as their surroundings because the stone came from not far away. They are well built, for Hopi men come from a

line of ancestors who have been using native stone for their housebuilding for a thousand years.

Nine of the Hopi villages are situated on top of the mesa, out near the tips of the fingers. From the valley, six hundred feet below, it is not easy to distinguish these villages unless you know what to look for and where to look. Fronting you, rises the escarpment of the mesa—with talus and larger rock fragments at the bottom, then a perceptible shelf where the strata change, and above that a vertical rock wall, ending in a sharp line where the level top of the mesa begins. The buildings that are visible blend with the rock structure.

In the broad valleys, called washes, that separate the mesa fingers, lie most of the Hopi agricultural lands and orchards. The fields and gardens, like the villages, have a way of being inconspicuous. They give little indication of their productiveness. An editor of a Western magazine who had driven through this country wrote pityingly of the Hopi people and their "struggle to wrest a meagre living from the reluctant land." He was sincere, but he did not realize that these areas, skillfully farmed as they are, really are productive. They do not look like farm lands elsewhere. By comparison they are unimpressive. But the widely spaced hills of corn, with plants no more than three feet tall, bear big ears and many of them. The beans and melons and peppers yield real harvests. The peach and apricot trees bear excellent fruit.

A Hopi woman of seventy, a gentle and valued friend, slipped out to my waiting car one day in my absence and left on the seat an ear of corn. "That's for him to show his folks," she explained to my companion. It was corn of the quality and size the Hopis commonly raise. I still have that ear. It measures twelve inches in length and seven inches in circumference. There are sixteen rows of deep, heavy kernels, and more than fifty kernels to the row.

In crops and food supplies, in roads and transportation, the sun in the sky is paramount in Hopi life. Equally it plays a leading part in their ceremonies and mythology. Its rising

race of accumulated soil, providing a slow but effective irrigation for crops on the terrace. In other places, flowing springs are formed. A few of these are large enough to water productive gardens.

The fields at the broad outlets of side valleys make use of the water that has fallen on the slopes and floor of the upper valley and on the adjacent section of mesa which is tapped by the valley. Sometimes in a heavy storm, water flows over the surface. Low earth dikes, new and old, help to prevent it from flowing too far and too fast. In the big principal valleys other fields have the benefit of water that has fallen miles away and slowly traveled underground. Crops in these fields are using water from an area many times as large as the fields themselves—the equivalent of a multiplied rainfall. These are the valleys, also, where floods may cut into the floor, forming deep arroyos and leaving fields stranded far above the new outlet.

The important part that sand can play in Hopi agriculture is one of the surprises that await a visitor. But it is not a new discovery, so far as the Hopi farmer is concerned. Far back in prehistoric days the pueblo farmer sometimes planted his corn and beans and squashes in the margin of sand dunes, or in other places where sand protected the fertile ground beneath, catching water that came as rain, permitting it to seep down into the soil, and preventing both runoff and evaporation. This same plan is made use of today. Dunes anchored by desert vegetation check floods that otherwise would destroy good land, and thus they become reservoirs. Of this the Hopi farmer is well aware, and on this he builds some of his success as a farmer.

With dunes to help, with terraces watered by seepage from springs, and with valley fields drawing on distant rainfall, the Hopis are raising today a wide variety of crops. Most of these are not new to them. A few were raised by their ancestors before Columbus was born.

The first time that I visited a Hopi village at harvest, I was

Terraced garden growing corn and beans
watered by a spring-fed stream

Garden in the bottom of a wash—a gamble
on a hard destroying rain

surprised to find some of the same varieties of vegetables that we raise. There were Hubbard squashes, both the dark green variety and the frosty gray-green. There were deep red beans. I did not then know that these squashes and beans were raised by the prehistoric people of this desert country. The Hopis did not acquire these varieties from us. It was the other way around.

Long experience has set the planting dates for Hopi crops. Traditionally the dates have been determined by the position of the sun with reference to landmarks on the eastern horizon.

The very first planting of corn—not for the main crop, but for corn to use in an important ceremony—is in March. The main crop comes later. Garden vegetables are spaced along, depending on variety. Sand-dune crops await the end of the sandstorms that sweep the country in June. The summer solstice sets the limit for very late planting or replanting. All this is necessary, since the growing season is usually no more than 130 to 140 days. In the far north, for example in Alaska, that would be ample because of extended daylight hours. But Arizona is not in the far north.

Corn, the first cultivated crop in the prehistory of our continent, remains today first in Hopi agriculture. Nothing else can take its place. Even if it were not so intensely involved in rituals, it would still be all-important because of the needs that it serves and its adaptation to the region. Nearly three-fourths of all cultivated land in the Hopi Reservation is planted to corn.

The ears of corn that are saved for seed are likely, in these days, to be the longest and most perfect. But in earlier years a different idea prevailed.

"My father," said an elderly Hopi to me, "always saved the little ears for seed—the short ones. That is the old Hopi way. But a man told us to choose the longest and biggest ones. So last year I tried that."

"Was it any better?" I asked.

"Oh, it was all right. Both ways were all right."

Four colors of corn are raised—white ears, likely to be the main crop; yellow ears, less common than white; blue ears, widely used in making piki for ordinary consumption; and red ears. A Hopi discriminates among these for their flavor. Each is adapted to its own cookery as well as its own occasion.

An extraordinary feature of Hopi corn-growing is the special variety of corn developed by the Hopis—a variety that can be planted deep and still reach the surface. Planting in a soil that is covered with a layer of sand means planting at a depth ranging from eight to eighteen inches. Even though no sand covers the surface, the seed must be placed so deep that it will be in contact with the moisture necessary for its germination. May and June, the time of planting, are months of little or no rain. The seed must go down to a low level.

Ordinary corn, if started at such depth, would never produce a visible plant. The seed might germinate, but the shoot would not be able to reach the surface. Hopi corn produces a shoot that is able to thrust its way up and up until it emerges and proceeds with normal growth. In addition, the germinating seed drives a root deep into the ground, in search of still more moisture. Feeding roots branch from this. The whole system is specifically adapted to specialized and difficult conditions.

Above ground, where the plant is exposed to hot sun and dry air, it is sparing of leaves and stalk. It hugs and shades the ground beneath it, continuing to conserve moisture. The ears are produced within a few inches of the ground. The plant's whole effort seems to be directed toward a maximum amount of actual grain.

No ordinary implement for planting corn can serve the Hopi farmer. Instead he makes use of a simple device which is identical with the one used by his remote ancestors. This is a planting stick, a straight, hard branch cut from a common desert shrub, greasewood. It is three feet or more in length and about an inch and a half in diameter. One end is shaved down to the shape of a chisel. The stick is thrust into

Planting corn with a planting stick

Sweet corn drying in the sun

the ground to a depth of ten or fifteen inches, or even more. Into the hole several grains of corn are dropped. The shoot from the sprouting grain pushes its way up.

It is not unusual for a Hopi farmer to have two or more plots of corn in widely separated locations. This is insurance. One plot may be situated where it is certain to have abundant moisture but may get too much in the event of heavy July rains. Another may need just such rain in order to make a crop. By good fortune, being in unlike locations, both may win.

At harvest time in a Hopi village, corn is drying near every home, or on the roofs. A low board platform, or sometimes an old bedspring, serves as a drying rack. On this the husked ears are spread in layers, two or three deep, so that the warm desert sun can dry them thoroughly. From time to time the owner shifts the ears about and turns them over, to hasten the process. There is little chance that any rain will fall at this time of year. After the corn is well cured, it is taken into the storage house, and there it will remain until it is used or some part of it is traded or sold. The ears of different colors are kept separate—blue, white, yellow, and red.

There is always a stock of corn ahead. A Hopi is likely to have some of last year's crop on hand when this year's corn is harvested. I suspect that deep in his being lies the memory of times when for days on end the sun rode through a blazing sky, the springs ceased to replenish the fields, and the prayed-for rains did not come.

In a Hopi home where I was a guest, we were talking about varieties of beans. My hostess, a woman in her sixties, left us to go into another room. In a moment she came back with three lots of beans, which she spread out on a table. Again she disappeared and returned with three more lots, all different. Once more she left and brought back three more varieties. Still others are raised, she said.

I have little samples of those beans before me as I write. They range in color from deep cinnamon brown with black markings, through orange-yellow and rose, to pure white.

They range in size from a tiny elliptical bean to a giant as big as a pigeon's egg.

My hostess was earnest in making clear to me the fact that different varieties have different flavors and are adapted to different uses and methods of cooking. The very large ones are the least distinctive.

"Those big ones are like potatoes," she remarked. "Not good flavor like the others."

Pointing to a flat bean of medium size, with a ground color of pinkish gray and markings of an interesting and varied pattern—no two alike—she said, "That is the old Hopi bean."

"Is it a good one?" I asked.

"Oh, yes!" she declared. "Oh, yes!"

Beans are threshed with a flail. I stopped to talk one day with two men who were finishing a job of threshing. The bean plants had remained where they grew until they were completely dry. Now the men had pulled up the plants with brittle pods still attached. Over the ground the men spread a square of canvas. On this they placed a layer of the plants, and around this they walked, swinging the flail stick and whacking the plants. Out rolled and jumped the beans.

It was a lively business. The men were far past middle age, but their vigor as they worked, and their quick and jolly manner as they talked with me, gave me the feeling that threshing beans with a flail in the cool and brilliant October sunshine must be an activity good for both body and mind.

Another day I saw several women and girls sitting on the ground around a canvas, vigorously swinging their flails. All were having an enjoyable time. It was a lively afternoon party. I was not near enough to hear their conversation, but I do not doubt that it was in keeping with the scene.

In September and October, Hopi gardens are dotted with watermelons and cantaloupes. I joined a Hopi friend in a visit to his garden plot. There were watermelons of two kinds, round ones and long ones. Both are standard with the Hopi people and are raised from seed saved each year. Both have

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Melon plants protected by a windbreak

Fields watered by a stream from a reservoir

dark-red flesh and a rind no more than half an inch thick. There were muskmelons—the old Hopi melons, my friend explained. With them were cantaloupes, round honeydews, big casabas, and yellow Persians.

My friend found a ripe casaba and cut it into crescents for us. The desert sun and the fertile soil had distilled in it a satisfying richness.

"I tried one in a restaurant in Flagstaff one time," he said. "It was pretty good. So I got the seeds. Then I went back and got another one and saved the seeds from that one, too. After I'd raised melons from those, I just kept on saving seeds."

Peach trees, standing in rows or in blocks, cover many acres near the Hopi villages. Often they seem to be growing in nothing more than sheer sand, but their roots are in moist soil.

One August day I visited a row of trees with their owner. They were large trees and were bearing a full crop. A few ripe peaches were on the ground, having fallen apparently within a few hours, for they were not decaying. I tried one and found it invitingly rich in flavor.

"What variety is it?" I asked.

"Oh, I don't know. I raised it from seed that I planted."

That was interesting. In other regions where peaches are grown, the chances of obtaining a satisfactory tree by planting a seed are only one in many. The experts explain that the character of the fruit has not been fixed by repeated, controlled breeding. But here in the desert, peach trees have been raised for scores of years—and orchard areas are separated from one another by vast spaces where no peach trees grow. The desert has contributed the necessary barrier, and the Hopis have developed a fruit adapted to their land.

I wondered if the remarkable flavor of the fruit might be offset by some less desirable characteristic—by too great tenderness, for example, making it impossible to transport it or to hold it for more than a brief period. On a subsequent visit my question was answered. A Hopi gave me a bag of peaches which I placed carelessly in my car. They rode there, unprotected, for three hot days. At the end of my journey they were still sound.

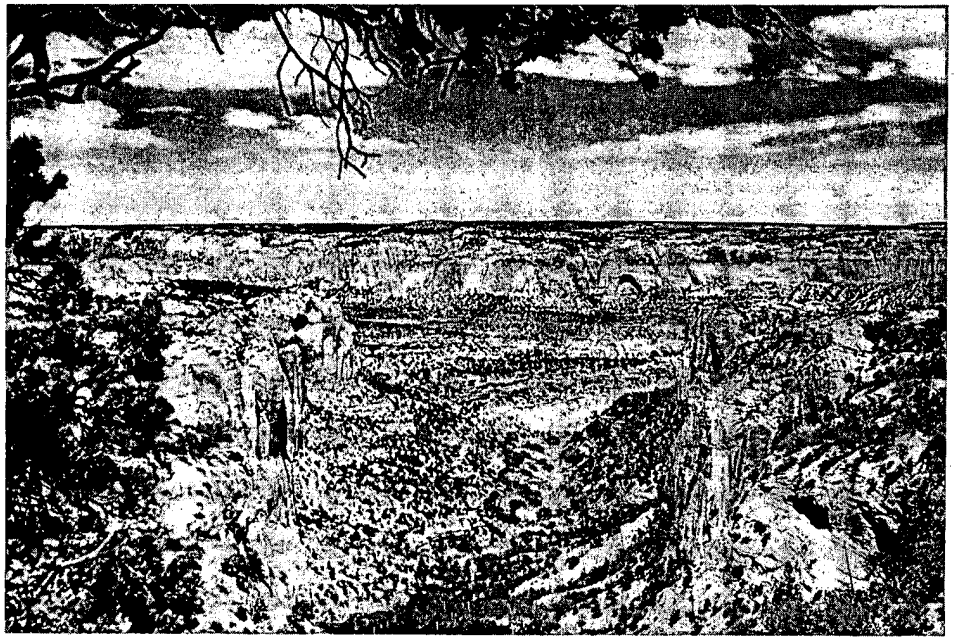
The peaches that are raised by the Hopi fruitgrower provide an item of winter food as well as fresh fruit in summer. The ripe peaches are cut in half and the stones removed. Then the halves are placed on racks or on a smooth stone ledge. The desert sun and air do the rest.

Apricots, also, are widely planted and, unless caught by untimely frost, bear a rich harvest. They seem to find the soil to their liking. Although winters are cold, the trees may live to a venerable age. I have stood beneath a tree, still vigorous and bearing heavily, which has a trunk like a barrel and a spread of branches like an elm. It was planted by the grandfather of a Hopi now in his eighties.

Only one Hopi village, Moenkopi, has farm land that is irrigated from a flowing stream. The operators of these farms are skillful in management of the water. None of it is lost, and all of it is made to serve to fullest advantage. The farmers take turns in the apportionment of hours when their land may have its share. A man may be on duty all night. He will explain to you that different crops need different amounts of water, and that the need varies also with the maturity of the crop. Too much may do as much harm as too little.

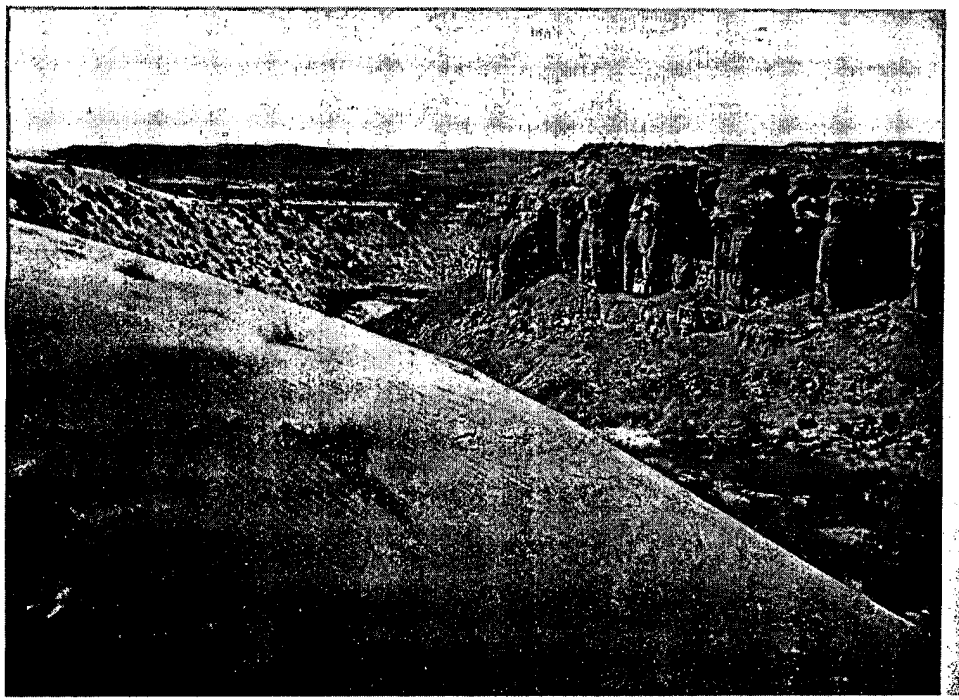
The growing conditions in the Hopi country have not remained unchanged down through the centuries. Like a great pendulum that requires a thousand years for its swing, the climate of northern Arizona has gone through cycles. Study of ancient sand dunes has outlined the story.

Slowly, decade by decade, the dryness and the heat imperceptibly diminish. The clouds bestow a little more moisture. The vegetation on plain and mesa grows more freely. Shrubs draw a little nearer to one another, and grasses fill the open spaces. The springs at the mesa's margin and in the canyons flow with more confidence. Soil builds up in the canyon floors and in the broad outlets of valleys. The runoff from a summer storm moves with less destructive violence.



In the great canyons bordering the Hopi country rock arches shelter many prehistoric ruins

The nearer wall of this canyon has been buried in sand swept in by the wind



Five hundred years pass, and the pendulum begins to swing in the other direction. Droughts come. Vegetation recedes. Flood waters are no longer restrained. The soil that has been built up through centuries is washed away. Canyon floors once rich in trees and grasses are cut to bed rock.

Within the long cycles shorter ones occur, perhaps approaching the greater movements in their intensity, if not in their scope. Local conditions, some of which may not be appraised, play a part. In terms of human occupancy of the country, these climatic changes may be vital in their effects.

One of the greatest of the canyons in the north was deserted by its inhabitants in A.D. 1300. It was again occupied and farmed in 1880. Now it is once more almost deserted.

With a Hopi friend I was crossing Oraibi Wash by the highway bridge. My friend looked down into the arroyo, sixty feet deep. "When I was a boy," he said, "this was all farm land here. It raised good corn. There wasn't any arroyo then." My companion had seen more than eighty years of Hopi life and experiences.

"Tell me," I said, "did the Hopi people ever have a serious time because of drought? I mean a famine?"

"Yes," he said. "A long time ago there was a drought that lasted for several years. All the food supplies were gone. Many of the people went to live in one of the New Mexico pueblos for awhile. The Indians there fed them and took care of them. Others stayed here and some of them starved. It was a terrible time.

"Then there was another drought when I was a young man. This one wasn't so bad, but the crops failed for two years. The corn was all used up. There wasn't enough to eat, and the people were hungry.

"This time the government sent a man to distribute some food. But most of the people wouldn't take it. They didn't want to take help."

"What did they do?" I asked.

"Oh, they worked."